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ABSTRACT

Although there is a great need for field workers in the process of social change in underdeveloped countries, there are several weaknesses in the field worker system: inadequate supply, narrow range of competence, inadequate quality control, and inflexible learning situations. In order to expand the reach and breadth of such non-formal education programs a pilot project involving unpaid, relatively untrained village volunteers equipped with audio cassette tape machines was devised. Three villages in the Quesada Valley in Guatemala were used as the study site during July 1974. Four cassette tapes were prepared, each 22-29 minutes in length and containing information, stories, and music in a magazine-type format. Evaluations were conducted among the volunteers and the general village populations. The study's results indicated that: in no case were the machines lost, stolen, or damaged; people in the villages listened to and learned from the tapes and acted upon what they had learned; the monetary cost of the system was minimal; the program worked as a latent training system for volunteers who became sought-after sources of information; and there were no logistical problems with batteries, tapes, or machines. The study concludes that the system can stretch rural manpower resources in rural development. (JR)

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STRETCHING MANPOWER RESOURCES FOR NON-FORMAL EDUCATION IN RURAL DEVELOPMENT: A CASE STUDY IN COMMUNICATION

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STRETCHING MANPOWER RESOURCES FOR NON-FORMAL EDUCATION IN RURAL DEVELOPMENT

Introduction

Because social change and rural development generally will not take place without effective communication links between the "change agents" and the people who live in rural areas, a project was established in Guatemala to test effective ways of creating both effective and efficient links. This project is a joint undertaking of the Government of Guatemala through its Ministry of Education, and the Government of the United States of America through its Agency for International Development. The GOG Ministry of Agriculture and the Washington-based Academy for Educational Development play key roles in the implementation of the project. An organization called Educación Basica Rural (EBR) was established to integrate the various human, economic and content resources to carry out the project.

The major thrust of the EBR program is outlined elsewhere.* This study deals with one aspect of that program: the introduction of an innovative communication system in several small Guatemala villages. However, it seems reasonable to assume that its findings can be applied, with adaptation, to other localities in Guatemala, Latin America and elsewhere.

Inter-personal communication and rural development

Individuals' decisions are the building blocks of "social change." Hence, considerable effort and resources go into programs designed to deliver information to people which will result in a change in their behavior. No competent communication

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* Basic Village Education Program in Guatemala. Academy for Educational Development, April, 1974.

person would claim that information alone will bring about social change, but he would argue that as long as individuals have the option to weigh alternative means and goals, communication must be considered one of the key ingredients in social change strategies and programs.

A major consideration, thus, is how best to communicate in a situation where a change agency makes a deliberate effort to cause change. Despite all that has been written in the last 30 years about various methods, the introduction of new communication technology prompts continual reassessment, testing, and re-evaluation of techniques. The tremendous potential of "delivery systems" such as communication satellites suggests the everchanging complexion of the alternatives available.*

Whatever the technology, there seems to be continued support for including some interpersonal contact by field personnel (extension agents, aides, village level workers, etc.) to link the change agency with the client community.

Both the importance and one of the key problems of the field worker system are highlighted in Robert McNammara's 1973 address to the World Bank Group's Board of Directors. After listing "expanded extension facilities" as one of the measures necessary to increase agricultural production, McNammara contends that there is no developing country which produces enough extension agents. Noting that in developing countries, the ratio of government agricultural agents to farm families is about 1 to 8,000, he argues that:

> As long as the supply of extension workers is grossly inadequate, only the large farmers will benefit, and the needs of the poor will be ignored.

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* We have included several publications in the bibliography to illustrate some of the more recent discussions of recent alternatives and technology.

Since agricultural extension systems have generally been developed longer than health, nutrition and family planning extension systems it seems fair to suggest that the number of field workers in those areas is even more inadequate.

Deficiencies in field worker systems

Despite their acknowledged importance in social change, it is important to identify briefly some of the weak points in field worker systems. One has already been mentioned: The inadequate supply of field workers. In Guatemala, the nation's 69 professional extension workers were able to reach about 5% of the farms at an annual budget of US$0.50 per farmer. If every farmer in the country were to be contacted by extension agents, at least 20 times as many extension workers would be needed and the yearly cost would be $10 per farmer. The per capita income for rural people in Guatemala is $75. Not only is there a question as to whether it is possible to justify an expenditure of 13 percent of this income on adequate extension service, but it would take 28 years just to train enough agricultural extension agents to do the job. (Wolf, 23)

A need to broaden the range of the field workers competence. There is a wide range of capabilities among field workers. In some cases, they have training beyond the secondary school level; in others, they may have no more than elementary schooling and perhaps some short-term intensive training. Whichever the case, they are seldom able to deal with information beyond "agriculture," or "nutrition" or "health." The cause of development might be better served if the scarce field worker could serve a variety of family needs. (Sometimes bureaucratic rules or jealousies prevent a field worker from going into "alien" information areas, as in the case of nutrition aides who were not supposed to deal with family planning information even though their homemakers requested it.)

Need for quality control. Although we have seen no specific data on quality control we suspect that there is considerable variability in how messages are communicated to clients from field workers. Some variability is desirable when it results from the field worker attempting to pattern his message to a particular situation. However, we assume that boredom, repetition, low motivation, and simple failure to understand content may warp the presentations of, especially, the lower level field worker.

Need for more flexibility in the learning situation. Although face-to-face contact may generally be a highly beneficial means of teaching or imparting new information, it has several drawbacks. For example, timing. The field worker's visiting time may not coincide with the client's most suitable or productive time for learning. And it may be difficult for the field worker to return later, after he has just bicycled five miles to get to the home. It is also difficult for people to initiate, face-to-face, discussion on some sensitive topics. Furthermore, clients may be reluctant or embarrassed to ask questions or ask for repetition or clarification of information in a face-to-face situation.

Thus, the question is: given the highly valued interpersonal touch provided by the field worker in non-formal education programs, how can this resource be stretched, both in terms of reach (the number of families contacted) and breadth (the range of subjected matter covered), given the limitations of numbers.

In Guatemala we explored the feasibility of using unpaid, relatively untrained village residents to carry out a modest NFE program with inhabitants of their aldeas (villages).

These workers were primarily equipped with audio cassette tape machines to carry out their task. Neither the workers themselves nor the villagers had had experience with this type of communication tool in the past.*

The communication situation

In attempting to discover suitable and effective ways communicating with rural subsistence farm families in Guatemala, we were concerned with using a method that had the following characteristics:

1) It relies most heavily on oral techniques since literacy levels and literacy saturation are both very low in rural Guatemala;

2) It could be used in conjunction with relatively untrained volunteers in the aldeas;

3) It is simple enough that there would be no need for people in the field, as volunteers or as consumers of the information, to learn complicated methods or manipulate complex equipment;

4) It is inexpensive and thus could reasonably be afforded by the low level budgets that inevitably have plagued government rural development programs around the world;

5) It could be localized to take into consideration the cultural and environmental conditions characteristic of a relatively small geographic area;

6) It could be used by rural people when they were ready to be exposed to the messages prepared by EBR.

7) It has potential for two-way communication, i.e., between the "consumer" in the aldea and the people in EBR.

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* We would like to acknowledge our indebtedness to the people from Educación Basica Rural, and from the Academy for Educational Development for cheerfully tolerating and supporting a venture that departed from the main format of the "basic village education" project. Our indebtedness extends to the Department of Communication Arts at the N.Y. State College of Agriculture and Life Sciences (Cornell University) for the generous loan of equipment for the study.

Audio cassette technology

We had used audio cassette machines successfully as a substitute for radios in "radio farm forums." There had been no difficulty in training the paid "monitors" to use them in sessions with farmer groups.

Success in using audio cassette technology (ACT) in conjunction with nutrition aides to commmunicate with low income families in rural areas of the United States further encouraged us to examine its potential in this new setting. (Papers by Colle listed in the bibliography discuss various aspects of these U.S. experiments.)

A feasibility project was designed to answer several very fundamental questions concerning the use of audio cassette technology in the rural Guatemalan context.

The key questions investigated in the project include:

1) Can the audio cassette technology survive handling in the rural setting without being broken, stolen, lost or otherwise abused? Most persons we talked with felt that it would be handled carefully and capably; however, we had encountered enough skepticism among government, foundation, and other agency officials to feel it necessary to include this question in the study.

2) Would the volunteer and audio cassette combination work effectively to
   a) get information to the homes,
   b) have them listen, c) learn, and
   d) act?

3) What is the cost of reaching people with the messages? We did not expect to be very definitive in answering this question for several reasons: it was difficult to assess thoroughly all the costs involved because we used some resources already available for the major EBR project, and because we were simply not equipped to carry out a careful "effects" study. We were also very much aware that some effects can only be measured over a span of time far longer than we had the luxury to commit to such a simple feasibility study.

4) What are the logistical problems in maintaining such a communication system, including supplying tapes and batteries, and supervising the activities of the volunteers?

It should be emphasized that the study was designed as a pilot study--one which would provide some clues for additional (perhaps more sophisticated) research, and some basic data for planning decisions in the overall EBR project.

Design of the project

1. Location. Three aldeas were used as the study site. These were in the Quesada Valley in Guatemala's Oriente. However, the aldeas were not among those being used in the main EBR communication project in the same valley.

2. Time. The project's field phase took place during July 1974 for four weeks. Approximately six weeks of preparation preceded the field operations. An additional five days were spent in early August carrying out the evaluation.

3. Message form. Four cassette tapes were prepared for use in the aldeas. Each tape (with the same "program" on each side) was 22-29 minutes in length. Each tape contained information, stories, and music in a "magazine-type" format. Interviews, talks, dramatizations, and monologues were used. Some of the information encouraged the listener to carry out some kind of action, such as buying and planting a new variety of sorghum, and making a simple mechanism for storing food and keeping it cool.

4. Distribution system. A volunteer was recruited from each of the three aldeas. (In one aldea, two volunteers worked as a team.) They were given a brief training program of three hours during which the project was explained to them and they were taught how to use the audio cassette equipment. In each aldea, two systems of distribution were planned: the "independent model" and the "dependent model."

   In the independent model, cassette machines and the initial tape were left at one household in each aldea. After that household in the aldea had the unit for one day, it was shifted to another household in the same aldea. The process of shifting was left to the households and the volunteer to work out. After the second household had the machine for a day it was shifted to a third--then to a fourth, and a fifth. During the second week, the pattern was repeated with another cassette tape.

In the dependent model, the tape machines stayed in the hands of the volunteer who would take the machine with him as he visited a pre-determined household each day. He covered five such households during the week, and then repeated the cycle during the second, third, and fourth weeks.

As the experiment developed, we discovered that the volunteers used their own ingenuity and initiative to get greater use out of the system than we had planned.

5. Evaluation. We used two methods for answering the questions we raised. First, we (literally, the authors) interviewed the volunteers, using a prepared interview schedule.

Second, two EBR staff members who had done extensive interviewing for various EBR operations in the past went to the villages to interview four categories of persons. These included: those who were involved in the independent model (Group I); those who were involved in the dependent model (Group II); a control group who lived in aldeas not being used in the study (Group III); and a sample of "spill-overs" (Group IV) -- persons who by some means or other had listened to one or more tapes but had not been included as a "household" in the project design.

The evaluation took place within one week of the time the last tape had finished its cycle and the equipment had been recovered. This prompt feedback from the field had several implications for the findings. In the first place, we would expect that information recall would be affected because of the short lapse of time. It would be helpful to do another survey after six months or a year to check on retention of information. On the other hand, questions related to behavior would be affected somewhat because some of the things recommended on the tapes (for example, trying a particular recipe, or preparing INCAPARINA, or making a cooler) had little time to be undertaken. Again, a later survey would be helpful.

Results of the study

To provide continuity and coherence, we are reporting our results according to the questions as they were raised on page 6.

1. Can audio cassette technology survive...in the rural setting....?

We cannot be sure how many different hands the cassette equipment passed through over the four-week period. Perhaps a fair estimate is that those hardest used were passed through a minimum of 20 households (five households a week, and recycled through the same households for four successive weeks).

We know from testimony of our volunteers that some machines were run throughout the day in a shoe repair shop; another was played regularly under a tree in the open in one community; and another was used regularly at a refreshment store where people gathered to hear it.

In no case did a machine get lost, stolen, damaged or even seriously marred. There was only one report that a machine was being "mishandled." This came from a conscientious volunteer who discovered that one family was playing the cassette machine all day long and was using up batteries faster than the volunteer thought they should. But the machine itself was unscathed.

It should be emphasized that only one person of all those involved in the field operation (volunteer or consumer) had ever used a cassette unit previously. Yet, the volunteers, who trained the people in the aldea to operate the equipment, reported no difficulties in the operation of the machines and reported that it was easy to demonstrate to the people how to operate the units.

No tapes were lost, destroyed or unwound. Each was in good enough condition to be continued on further cycles had they been needed.

2. Would the volunteer and audio cassette combination work effectively....?

In the survey made of "consumers" in the aldeas, ten information-level questions were asked of each of the respondent groups. (See page 8, section 5.) Following are the results.

The notations used in the chart are:

Subjects: I - Independent model III - Control group
II - Dependent model IV - Spill-over group

Score (S): The number indicates the total number of correct answers given for all 10 questions.

Total possible (Nx10): Indicates the number of people in the category multiplied by the number of questions in the test to give the total number of possible correct answers.

Percentage (%): This is S divided by Nx10. The higher the percentage, the greater the incidence of information gain.

A. Information Gain

Subjects	S	Total Possible (N x 10)	% Correct
I (N-11)*	63	110	57
II (N-13)*	73	130	56
III (N- 7)	8	70	11
IV (N- 9)**	36	80	45

* We are not fully confident as to exactly how many respondents were in each of these categories. As mentioned earlier, the team of volunteers in one community encountered very heavy use of a machine when it was left in a home, so they modified the design somewhat, by converting independent households into dependent households when they felt it would serve the best interests of the project.

** This represents a small sample of the "spill-over" audience. We do not have an accurate accounting of this group because data was not collected on the number of persons who gathered to listen under a tree or at the refreshment store. In some cases, volunteers were stopped on the roadway by persons who wanted to hear the tapes. In another case, a whole visiting soccer team asked to listen to them. We are somewhat surprised that the scores for IV are as high as they are because nothing in the study design established conditions for repeat listening by spill-over listeners.

These data indicate quite clearly that people in the aldeas listened and learned from the tapes. We found also that majority of the people who were in the independent model (and thus had the opportunity to do so) listened to the tapes more than once. Although the dependent model is less conducive to this repetition, we found considerable evidence that repeat listening also took place among them.

Although liking a system is not the same as listening or learning from it, they are obviously related. We asked our interviewers to make a judgement after the interview was over as to the degree of enthusiasm or lack of enthusiasm the respondents seemed to have for the cassette system they had used. The interviewers were instructed to rate the response on a five-point scale from "enthusiastic" (1) to "not enthusiastic" (5) with "neutral" serving as a midpoint. Following are the results:

B. Enthusiasm for system of getting information

	1	2	3	4	5
I	7	4	0	0	0
II	12	1	0	0	0

Overwhelmingly, the consumers were enthusiastic about the process -- and no one surveyed rated the system as low as "neutral."

Behavior measures. We indicated earlier what some of the behavior measures were. In this data, we are reporting all behavior changes together although some of the actions encouraged involve more complexity than others.

In this data, S indicates the number of actions actually taken, and Nx5 indicates the number of total "actions" that the Group as whole could have taken as a result of the tapes. The percentage indicates the ratio of actions taken, to those total actions possible.

C. Behavior change

	S=	Nx5=	%
I	23	55	42
II	31	65	47
III	7	35	20
IV	9	40	23

Again, it seems quite clear that information on the tapes provoked people in the aldeas to carry out various kinds of action. Groups I and II carried out more activities discussed on the tapes than the control group or the spill-over group. We checked this from another point, also. We asked the volunteers if they knew of anything that happened as a result of the tapes. In one community, they reported that a great deal of sorghum seed of the new variety mentioned in the tapes had been purchased. We checked this with the regular agronomist (Extension Agent). His report substantiated these observations. According to his report, 10 quintales (1000 pounds) of improved sorghum seed had been sold in the communities when we promoted it. According to the agronomist, indications from the people in these communities show that many farmers planted sorghum as a second crop in accordance with our recommendations even though they did not customarily plant sorghum.

An action that was not included in the list of five compiled was "discussion." The volunteers reported that in more than 50% of the situations in which they participated (i.e., the dependent model) spontaneous discussion of the content followed the playing of the tape. Often, they said, points not understood by some members of the group would be explained by other members. There is also evidence that discussion often followed playing of the tapes in the independent model.

3. <u>The cost of reaching people and the role of the volunteers.</u>

As can be expected from field research where generous use is made of untrained and relatively inexperienced people, surprises occur. One of the major "surprises" that appeared in this study was the ingenuity and the resourcefulness of the volunteers. These were unpaid people who did this job while also carrying out their regular activities in the community. One was a farmer, two were 6th grade students (about 18 years old), another was a tailor. Often, the volunteers discovered ways of extending the coverage of the cassettes beyond what they had been instructed to do. We expected some spill-over audience based on our previous experience with this type of system, but it went beyond our expectations. One of our volunteers estimated that he reached 100 farmers a week with his equipment and tapes. This was about 5 times the number specified in his instructions. If we are rather conservative in estimating the costs of tape and equipment, we estimate the cost of reaching each farmer to be approximately 2-3 cents per week for approximately 25 minutes "exposure" time. This figure is based on depreciating a tape machine in six months' time, "losing" one tape a week, and using two sets of batteries a week (which is about the rate used in this test by all of the volunteers). Obviously this does not include the production costs involved--something we were not able to estimate very effectively. However, it should be remembered that content, once developed, can be recycled in other communities and in other years.

In estimating costs, farmers reached, and effects, we are on very unsteady ground. It will take more controlled tests than we were able to undertake to get a more satisfactory estimate.

One effect that we did not try systematically to measure was the impact on the volunteer. But some general observations are worth reporting. We did ask questions which allowed us to conclude that the volunteers themselves learned from the tapes; they tried some of the actions recommended, and they became respected sources of information in the community as a result of their involvement with the cassette communication system. In fact, the volunteers became transmitters themselves of the information that had been communicated on tape.

Each of the volunteers from the three different villages carried some stigma that would otherwise have kept him from being a respected source of information in the villages. One was illiterate, one was a military agent, believed to hold the job for his own benefit (a type of traitor), and the volunteers from the third village were two sixth grade boys, who because of their age were thought of as inexperienced. Yet as mentioned earlier, in a month's time, we were able to see them transformed into sought-out sources of information.

Informal discussions motivated by the cassette contents that usually took place after the farmers listened to the tapes added cohesiveness to the village goups. As a result of one of these spontaneous meetings, one of the volunteers was able to get the village men organized to repair a seven-mile stretch of road into town. Although the tapes carried no material or message to directly motivate them to cooperate, the system itself brought the men together and gave them the intial ground for communicating that led them to act together for the common good.

We have seen in previous cassette communication research the impact made on the para-professionals and volunteers who ostensibly serve as carriers of the technology. What actually seems to happen is that these people undergo changes in their competence and, in some cases, in their personality and social relations, which make them more valuable as volunteers even without the aid of the cassette equipment. What we have, in fact, is not only a system of communication for "consumers" but a latent training system for volunteers.

We did not try to activate a feedback system. However, at the end of the study, two volunteers (the highschool boys) requested a microphone so they could go back to their communities to record comments of their constituents. Obviously, the possibilit existed, and the volunteers themselves recognized it.

4. What are the logistical problems...?

None of the volunteers or the consumers reported any difficulty in getting batteries, or in operating equipment, receiving the tape recorder, or getting the tapes. The volunteers created their own system for controlling the replacement of batteries. They provided consumers with batteries when they said they needed them--but before giving new batteries the volunteers required that the consumers surrender the expended batteries. We are confident that the volunteers headed off any possibility of profiteering from replacement batteries. It should be remembered, also, that the circulation of machines in the independent model was largely accomplished by forces already existing in the aldea. The mechanism for moving the machine from one household to another were worked out among the parties concerned, and although there was sentiment for retaining machines longer in some households, we found no evidence of the machines not moving to their appointed places when they were supposed to.

Summary.

Several things emerge from this study. Because it was a feasibility study conducted under considerably less than the optimum research conditions, these should perhaps be treated as suggestive rather than definitive. But they point to the need for examining the potential of audio cassette technology as a very important communication system for reaching subsistence type farmers.

Among the observations we would like to underscore are the following:

1. Rural people are quite capable of handling audio cassette technology without abusing it.

2. They can and do learn from the system.

3. They can be stimulated to act--in fact, where other systems seem not to have made an impact, audio cassette technology used as we have described seems to motivate action.

4. The dependent and the independent models seem to operate equally well. We need more information on the conditions under which each operates best. Our volunteers were divided as to which they liked using best. We suspect it relates a good deal to their other responsibilities in the community as much as it does to the systems themselves.

5. The cost of communicating via audio cassette seems well within the budget of any government which takes rural development seriously.

6. Volunteers can be used effectively to provide personal contact. Though their training may be brief, they can deliver messages widely into the community without the information losing "integrity." In our pilot study, persons were contacted that the regular agronomist might never have reached. On the other hand the agronomist had more opportunity to collect and develop material that could spread through this network. We did not push the possibility as far as we might have; but it was clear that a field worker, supported by volunteers and a cassette system, could expand content to meet needs of the community that transcend individual ministries.

A final note.

There is much yet to learn about the potential of this type of communication. We see, for example, excellent possibilities of tying it in with visual materials such as slides, filmstrips, booklets with pictures and a limited number of words, etc. There is a need to discover more about whether the appeal and power of the system lies partly (or mostly) in its novelty or whether it has durability over great lengths of time. It seems possible, for example, to use an audio cassette system such as we have described for periods of two or three months in a community, and then shift it to another community with another set of indigenous volunteers. Later it could be cycled back to the already initiated community with additional or new information. A rural development agency could, for example, cycle a cassette communication system among four or five communities, with each using it three or four times a year. We anticipate not only the reaching of a great number of farm families, but the latent training of volunteers as a by-product.

Despite many questions that still exist, we think the evidence indicates that the system can stretch manpower resources in rural development. We think it may be as powerful a system as satellites and television. The need now is to move ahead and refine our research through vigorous longer term action programs in the field.

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